"On Diselectrification produced by Magnetism. Preliminary Note." By C. E. S. PHILLIPS. Communicated by Sir WILLIAM CROOKES, F.R.S. Received June 13,—Read June 15, 1899.

The writer has found, that, under certain conditions, an electrified body rapidly loses its charge when in the neighbourhood of a magnetic field. Nor does it, so far, appear essential that there be any relative motion between the lines of magnetic force and the charged body itself.

Preliminary experiments have been made with apparatus consisting of a glass tube six inches long and one inch in diameter, at the centre of which there was cemented upon both the inner and outer surfaces, a strip of tin-foil one inch wide. Suitable connections were then arranged for the purpose of charging either of these metallic layers by means of an electrical machine. The pole-pieces of a powerful electro-magnet projected into each end of the glass tube, through an air-tight flange, and in such a manner as to ensure the production of a strong magnetic field at the central portion of the tube. A Sprengel air-pump was used to rarefy the gas within the tube, and, in the first instance, the inner coating of tin-foil was charged positively.

This charge gave rise to the well known free positive and a bound negative charge upon the outer tin-foil coating, the presence of the former being indicated by the divergence of the leaves of an electroscope connected to that coating. While the pressure of the gas within the glass tube was varied over a range of from atmospheric pressure to that represented by 0·2 mm. of mercury, the charge upon the inner coating being either positive or negative showed no appreciable indication of being affected by the turning on or off of the magnet. But at pressures lower than 0·2 mm., and when the inner coating was positive, the sudden collapsing of the electroscope leaves pointed to the removal of the charge through the action of starting or stopping the magnetic flux. Although the effect was more powerful at the moment of making or breaking the magnet circuit, it persisted in a modified degree as long as the magnetic field existed. No such effect was observed when the inner coating was negatively charged, nor was there any action even in the first case when the magnetic pole-pieces, projecting into the tube, were magnetised so as to be either both north or both south.

The leaves of the electroscope were then connected to one of the internal pole-pieces, and it was seen that if sufficient positive electricity were supplied to the inner coating while the magnet was excited, it became rapidly withdrawn, and ultimately resided upon the pole-pieces themselves.